

Policy Backgrounder

Green Operating Practices Policy for Municipal Buildings

Report to City of Dawson Creek

Kristin Zarowny, BSc • Matt Horne, MRM

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Executive Summary

The Pembina Institute was hired to evaluate existing green building programs (as opposed to those for new construction) to determine their ability to green the operations of municipally owned buildings in Dawson Creek. The primary outcome of this research is a policy document that contains those elements and strategies that together push the municipality towards its sustainability vision.

This backgrounder document provides the rationale for the policy, the criteria to ensure an effective policy, and the strategies to meet the policy objectives.

Two existing green building certification programs were considered in light of the criteria: LEED-EB (Leadership in Energy and Environmental Design for Existing Buildings), and BOMA Go Green Plus (Building Operators and Managers Association).

It was found that the current versions of the two leading green building programs do not meet the criteria. It is advisable to create and adopt a made-in-Dawson-Creek policy, which would be continuously improved to reflect the City's needs. Both programs could be re-visited in the future if, or when, the City wishes to obtain certification for their efforts at greening operations of their buildings.

Appendix A contains the Policy Goals, while Appendix B contains the Policy document outlining the guidelines and objectives that will go to City Council for resolution.

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1. Introduction

“In their roles as energy consumer, producer, regulator, policy maker and planner, urban governments can both save energy and ensure fiscal solvency” (Henderson, 1981).

The City of Dawson Creek commissioned the Pembina Institute to research and develop a policy for green building operations after having been engaged in community energy planning and sustainability initiatives with the institute for the past four years.

This backgrounder document provides the rationale for creating the Green Operating Practices Policy for Municipal Buildings, the set of criteria which ensures an effective policy is created, and the research on green building programs which led to the development of the policy recommendation. Two existing green building certification programs were evaluated in light of the criteria: LEED-EB (Leadership in Energy and Environmental Design for Existing Buildings), and BOMA Go Green Plus (Building Operators and Managers Association).

The Policy Goals can be found in Appendix A, while the Policy document can be found in Appendix B.

Background

The City of Dawson Creek operates and maintains twenty-six municipal buildings which together are responsible for contributing seventy-six percent of the municipality’s total annual greenhouse gas emissions (based on emissions estimated in a 2005 baseline study).

According to the City’s website, its goal is to be sustainable in the areas of “social, cultural, economic and environmental vitality”. Currently, much of the City’s effort is focused on reducing the environmental impact of municipal operations as a first step in its journey towards sustainability (<http://www.planningforpeople.ca/index.asp>).

Through the energy planning process, it has been recommended that in order to reach environmental goals, the municipality create a green building policy that would guide building upgrade, retrofit and material purchasing decisions and operating practice in order to help reduce energy consumption and overall environmental impact. Based on the baseline study’s recommendations, a Green Vehicle Purchasing Policy was created and is considered a parallel policy to this one. This is the second policy the City will implement from those recommendations.

More recently, as a signatory to British Columbia’s Community Climate Charter, the City commits to have carbon neutral municipal operations by 2012. Although *carbon neutral* is not explicitly defined, the Charter document refers to reducing overall greenhouse gas emissions. We assume the definition of carbon neutral is net zero CO₂e emissions. CO₂e is a way to express total greenhouse gas emissions in terms of the equivalent amount of carbon dioxide (CO₂). The amount of emissions that needs to be achieved by reductions as opposed to purchased in the form of offsets is undetermined at this time.

The City has also adopted community-wide emissions reductions targets, so it is important that this policy can build a framework for engaging the entire community in sustainable operating practices for buildings.

Rationale

Burning natural gas for space and water heating produces greenhouse gas (GHG) emissions that contribute to climate change, and local air emissions (Criteria Air Contaminants – CACs) that degrade local air quality. This policy will help to reduce building emissions by advancing energy efficiency, building commissioning, and renewable energy. Although electricity is not a significant source of GHGs and CACs, it is considered a priority to reduce the amount of electricity consumed in municipal operations.

Green buildings not only support municipal conservation and environmental goals, but can also be cost-effective. This policy will help reduce energy costs over time, and will insulate Dawson Creek from price fluctuations. Municipal building operations and maintenance will be an ongoing expense in Dawson Creek. This policy will ensure that life cycle costs are considered for related purchases and that energy efficiencies are maximized, and pollutants are minimized.

Green buildings provide healthy places for people to live, learn, and work where they will be more productive and satisfied.

2. Criteria for the creation of an effective policy

Effectiveness and appropriateness: The policy must be easy to implement and must meet the needs of the City. The policy must not be overly onerous in terms of administration, measurement, or verification, and it must apply to smaller buildings, which comprise the majority of buildings in the municipally owned portfolio.

Direction: The policy must set clear goals and objectives while considering the needs of a small municipality. These will ultimately shape what the policy aims to achieve, and helps guide the decision to invest in energy efficiency, improved indoor air quality, and reduced waste, contaminants, and pollutants.

Goals: Goals are what specify the commitments. “Energy-specific goals usually include commitments to improve the energy efficiency of facility operations and equipment, reduce peak energy demand, and lower energy costs. Beyond these, municipalities can also include non-energy related goals as part of the policy” (Flex your power, 2007).

The policy goals developed for Dawson Creek can be found in Appendix A, Policy Goals.

Objectives: These “flow from the goals, setting quantitative, measurable tasks” wherever possible (Flex your power, 2007).

Strategies: It is important to note that not all the strategies described here in this section are included in the first version of the policy document, which can be found in Appendix B; however, these strategies do represent the primary focus of this first version of the policy.

The major strategies are energy management, procurement, healthy environment, investment, and continuous improvement.

- ∞ The *energy management strategy* consists of increasing energy conservation and energy efficiency, and increasing the use of renewable energy through a combination of efforts aimed at improving the operation of mechanical systems and other energy-consuming equipment. More specifically, recommissioning, building audits and building operator training are useful strategies. Recommissioning looks at the digital controls system for

heating, ventilation, and air-conditioning (HVAC) equipment, and optimizes, for example, the occupancy schedule and temperature set points for maximum energy savings. Building audits not only provide a detailed look at energy consumption in a building, but also point to possibilities to improve efficiency or increase the integration of renewable energy systems. Building operators and managers are increasingly integral to the success of energy management. A report on various trends which are expected to impact building operations and management shows that facility managers will play a growing role in supporting productivity, innovation, and public perception, as well as playing a role in environmental responsibility, energy management, and air quality (Future Trends, 2007).

- ∞ The *procurement strategy* involved specifying environmentally and ecologically sensitive products with third-party environmental certification, rather than simply purchase those products that provide the best value economically speaking. This simple resolution would contribute to reducing persistent toxic pollution caused by products and materials such as office supplies, furniture, paper, electronics, building materials, and cleaning supplies. In 2002, Seattle, Washington, became the first major city to pass a resolution to phase out the purchase of toxic products. The City of Seattle demonstrates the wider-reaching benefits of adopting such a policy:

“The adoption of clean purchasing policies by cities increases awareness of the dangers of persistent toxic chemicals and, by creating demand for a wide range of cleaner products, lowers the costs of these products for the general public” (Seattle Washington, 2003).

- ∞ The *healthy environment strategy* considers non-energy related impacts to our indoor and outdoor environments. Although the following list is not exhaustive, these strategies include reducing impacts to water, land, and indoor air quality. Pesticide use by the municipality could be eliminated in favour of human-and earth-friendly pest control methods. Green housekeeping and materials management practices could be developed. A healthy indoor environment is important for many reasons since it “has the potential to reduce significantly instances of illnesses related to poor indoor air quality resulting in healthier and happier workers, higher productivity and considerable long-term cost savings” (Anchin, 2006)
- ∞ The *investment strategy* needs to ensure the provision of finance for projects committed to under the policy. The City could set aside a percentage of the annual energy expenditure for energy efficiency or renewable energy projects. The policy should also highlight the importance of City staff to seek supporting funds from other levels of governments and agencies as available to leverage the City’s dollars when funding energy efficiency or renewable energy projects.
- ∞ The *continuous improvement* of the policy and staff capacity is critical to the policy’s long-term success. As with any good policy, a strong green municipal facility operations policy is not a static entity, and will be evaluated and updated periodically to ensure that the goals and objectives are being met. Continuous improvement of both the policy and staff capacity can also be ensured by expanding networks and engaging with progressive facility management departments in other municipalities. A successful implementation of this policy will depend partly on the capacity of the building operators to improve energy

management; therefore, professional development for building operators in the form of training opportunities would contribute to continued success.

3. Policy recommendation

The Canada Green Building Council recommends “owners of existing buildings who seek green certification for their operating practices consider either the LEED-Existing Buildings program or [BOMA] Go Green Plus” (Collaboration, 2007).

Each of these two certification programs for green building operations was assessed to determine, if adopted as policy, whether it would meet the criteria for an effective policy as outlined in Section 2: Criteria for the creation of an effective policy.

Three possible outcomes emerged through the course of this research.

- ∞ First, the City could adopt LEED-EB as policy (and would enroll in the LEED-EB program to seek certification for all municipally-owned facilities).
- ∞ Second, the City could adopt BOMA Go Green Plus as policy.
- ∞ Third, the City would not enroll in a certification program, but would rather create a made-in-Dawson-Creek policy, and certification could be pursued later.

After careful consideration, it was determined the third option best meets the criteria as defined by the City of Dawson Creek. Rather than enroll to pursue certification from either LEED or BOMA, an overarching policy would be created using some elements of both BOMA and LEED as the foundation. The certification checklists for LEED and BOMA were examined in collaboration with the Director of Development for the City of Dawson Creek to determine which were most suitable in advancing Dawson Creek towards its goals.

The result of this effort can be found in Appendix B, Policy.

4. Green building certification programs: an evaluation

The following section compares LEED-EB and BOMA Go Green Plus with respect to the criteria. It was determined that although either program could meet the majority of criteria, neither works well for a small municipality with relatively small buildings. The cost involved in following the certification process is also inhibitive.

LEED for Existing Buildings is, at this time, only available through the US Green Building Council (USGBC). According to the USGBC, LEED-EB “is a tool for the ongoing operations and maintenance of existing buildings. The rating system identifies and rewards current best practices and provides an outline for buildings to use less energy, water and natural resources; improve the indoor environment; and uncover operating inefficiencies” (LEED-EB, 2007). The rating system assigns points in categories of green building operations and different certification levels are achieved depending on the number of points earned. A building is a viable candidate for LEED certification if it can meet all prerequisites and achieve the minimum points required in a given rating system.

LEED-EB is the more administratively complex of the two, and would require staff training and outside consultants in order to participate. LEED-EB can be rather expensive. Depending on the level of certification the City would wish to achieve, the cost can range from two to four dollars per square foot. Also, LEED-EB involves large amounts of statistical data and energy-use

reporting which, while potentially onerous, could easily be used to market the community green building policy to the general public. For example, the reduction in number of sick days, amount of waste diverted from the landfill, and increases in carpooling are all potentially powerful indicators (Demand Side Energy, personal communication, August 13, 2007).

According to the Building Operators and Managers Association, BOMA Go Green Plus is “an online assessment tool that measures the environmental performance of commercial buildings. Go Green Plus delivers scoring reports on how a building is performing, as well as providing very specific questions that enable the building manager to look at the components needed to achieve the benchmarks” (<http://bomagogreen.com>).

There are several advantages to certifying with BOMA Go Green. BOMA Go Green is less expensive than LEED-EB with certification costs as low as one to two dollars per square foot (A. Gorayshi, personal communication, August 13, 2007). BOMA Go Green Plus has been adopted by the federal government for all federally owned buildings and is very strongly supported with over one hundred buildings certified in British Columbia alone. BOMA Go Green Plus has options for portfolio management so may be ideal for a municipality

Currently, the Go Green Plus online assessment tool is designed to accommodate input from buildings occupying no less than 100,000 square feet. The portfolio of municipally owned buildings in Dawson Creek contains only one building that meets this criteria.

There are definite advantages to enrolling in the BOMA Go Green Plus program; however, the assessment tool does not accommodate a portfolio containing smaller buildings so the recommendation is not to pursue certification through this program at this time.

Appendix A: Policy Goals

1. To meet the target of being carbon neutral by 2012 by reducing greenhouse gas (GHG) emissions that contribute to climate change.
 - ∞ Increase energy efficiency of lighting systems
 - ∞ Conserve energy by right-sizing equipment and turning off lights and appliances when not in use
 - ∞ Increase energy efficiency of space and water heating systems
 - ∞ Switch to less greenhouse gas intensive fuels (including renewable forms of energy, solar water heating is an example)
 - ∞ Prioritize implementation of projects according to life-cycle cost analysis (or other measure that accounts for environmental costs)
 - ∞ Increase the use of renewable energy through on-site generation and the purchase of certified renewable energy credits.
2. To reduce the environmental impact of municipal activities (by accounting for non-climate change related impacts).
 - ∞ Reduce local air emissions (Criteria Air Contaminants – CACs) that degrade local air quality by reducing the consumption of fossil fuels
 - ∞ Reduce environmental impact by adopting environmentally responsible best practices.
 - ∞ Purchase products and materials that meet third-party environmental certification (including paper, cleaning supplies, building materials, electronics,
 - ∞ Decrease water consumption
 - ∞ Provide healthy interior environments
 - ∞ Increase opportunities for full recycling and reducing wastes
3. To provide a framework for lessening the environmental impact of building operations that can be adapted and expanded to the community level. This policy will provide a starting point to engage on green building opportunities throughout the municipality.
4. To increase the use of renewable energy.
 - ∞ Buildings will be constructed and upgraded to incorporate onsite renewable energy systems where appropriate.
 - ∞ Certified renewable energy credits will be purchased when appropriate.

Appendix B: Policy

Dawson Creek Green Operating Practices Policy for Municipal Buildings

Background

In 2004, Dawson Creek completed a baseline study on its municipal energy consumption that showed the electricity and natural gas consumption in buildings is responsible for 76% of the City's GHG emissions. Through the energy planning process, it has been recommended that in order to reach environmental goals, the municipality create a green building policy that would guide building upgrade, retrofit and material purchasing decisions and operating practice in order to help reduce energy consumption and overall environmental impact. An overview of the different components and options for a green building operations policy was prepared and presented to Dawson Creek in July 2007. The policy that follows reflects the goals and direction that Dawson Creek chose from these options. For background information on each section and on the development of this policy, please see the *Green Operating Practices Policy for Municipal Buildings: Backgrounder*.

Through Dawson Creek's sustainability planning initiatives, the City has adopted targets and policies (accurate as of January 2008):

- ∞ The *Green Vehicle Purchasing Policy* is a parallel policy adopted to address the reduction of emissions due to municipal transportation activities.
- ∞ The City of Dawson Creek has adopted the following targets for the entire community:
 - 85% below 2006 levels by 2050
 - 33% below 2006 levels by 2020
 - 14% below 2006 levels by 2012
- ∞ The City has also signed onto the Community Climate Charter, which commits the City's municipal operations to become carbon neutral by 2012. Although *carbon neutral* is not explicitly defined, the Charter document refers to reducing overall greenhouse gas emissions. We assume the definition of carbon neutral is *net zero CO₂e emissions*. CO₂e is a way to express total greenhouse gas emissions in terms of the equivalent amount of carbon dioxide (CO₂).

While the aim of this policy is to cover all the ways to reduce the full scope of environmental impacts due to municipal activities and building operations, the degree of detail presented here varies. The area of energy management has been developed more fully in light of the municipality's *carbon neutral by 2012* commitment; therefore, future updates to this policy may include further detail in other areas.

Policy Objectives

1. Building Audits

- 1.1. Each municipal building requires an energy audit once every 5 years or as needed and re-commissioning of HVAC systems to ensure that all energy systems operate at

optimum efficiency levels. Recommission the systems as per recommendations in building audit, do this as often as doing audit.

- 1.2. Ensure building operator training in energy management is included as part of the building audit/recommissioning. A building can have the most efficient energy system, but if the operator doesn't know how to operate the system, energy savings will not be realized.
- 1.3. Energy Audit results will provide energy consumption for comparison purposes with benchmarks and to track savings estimates.

2. Renewable Energy

- 2.1. Back up power: Solar system, wind system or combination of the two will be used to provide back up power (instead of diesel generators). Provide a complete system for back up power, battery-supported solar system.
- 2.2. Capital turnover: As a building energy system is replaced, install at a minimum an onsite renewable system in combination with high efficiency conventional system as redundant system. Install onsite re system as needed in combination with a high efficiency conventional system.

3. Water use by Buildings

- 3.1. Meter, account for and monitor water consumption. Set targets for water use reduction.

4. Recycling

- 4.1. In each building, provide adequate recycling containers. Enhance recycling systems and increasing recycling rates with single-stream, desk-side recycling for paper, plastic, aluminum and cardboard.

5. Purchasing (procurement)

The City will purchase what provides the best value while meeting the following criteria:

Should be 5.1 Evaluation in start of purchasing procedure, similar to right-sizing in vehicles policy.

- 5.1. Energy consuming/demanding devices/appliances/products: Only high efficiency appliances/equipment/devices will be purchased. EnergyStar rated products receive priority consideration.
- 5.2. Water consuming/demanding devices/appliances/equipment/products: Only high efficiency devices/appliance/equipment/products will be purchased. EnergyStar rated products receive priority consideration.
- 5.3. Products and Materials: The most environmentally responsible products possible should be purchased for use/installation in buildings. The products purchased should be certified as environmentally responsible by a recognized third-party industry-standard environmental certification body. One example of such a certification is EcoLogo certification..

6. Investment

- 6.1. Provision of Finance: It is critical to have funding set aside for these projects, presented here are two options. 1) An amount equal to 'x' percent of the Municipality's annual energy expenditure will be invested in energy efficiency each year. Or 2) A Green Fund: 'x' \$/tonne of GHG emissions attributable to municipal buildings will be set aside as a green fund to undertake the priorities outlined by this policy. The policy to govern the provision of finance will be developed separately.
- 6.2. Evaluate decision in ways to include life cycle energy and environmental costs in investment decisions.

7. Operations

The City will adopt environmental Best Management Policies for the following (for everything discussed in this policy, provide additional guidance at the operational level, City will provide BMP for env practices for the following:

- 7.1. Energy Management
- 7.2. Recycling and Waste Management Plan
- 7.3. Building and Mechanical Maintenance
- 7.4. Stormwater Management Plan
- 7.5. Integrated Pest Control and Management Plan
- 7.6. Landscape Management Plan
- 7.7. Green Housekeeping Plan

8. Education

- 8.1. Education: The City will endeavour to educate building users to follow the best practices for energy management and environmental responsibility.

9. Measurement and Verification

- 9.1. Overall consumption of energy from buildings should be monitored to verify reduction.

10. Evaluation

- 10.1. Monitoring objectives: The objectives in this policy should be measured at regular intervals to ensure that the policy is effectively moving Dawson Creek towards its goals.
- 10.2. Policy evaluation: This policy should undergo regular evaluation to ensure that it is enabling Dawson Creek to move towards its goals.

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